



**RENEWABLE  
CITIES**

# SYNTHESIS REPORT

## GLOBAL LEARNING FORUM



**SFU**

CENTRE FOR DIALOGUE  
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# INTRODUCTION

The following report is a synthesis of the key findings and takeaways from the Global Learning Forum, held in Vancouver from May 13-15 2015, from the perspective of the Renewable Cities team. It reflects the major ideas we heard during the Forum that we think should inform cities and citizens that aim to transition their cities to 100% renewable energy. These points are equally valid for cities that seek to make ambitious shifts in their energy use in favour of renewables, even if they are not yet in a position to commit to 100%.

Renewable Cities will use these findings to guide our work over the next two years, and they will shape our approach to designing a second Global Learning Forum. At the conclusion of this report, we identify a number of topics which were not addressed in depth in this Forum and which would merit deeper discussion in future international dialogues. We would welcome working with other partners to convene new dialogues to explore these issues.



# CONVERGING TRENDS

The Global Learning Forum highlighted the convergence of three global trends:

- The rapid fall in the cost of new renewable energy technologies, especially solar PV panels, that are now making renewables cost competitive with fossil fuel and nuclear energy sources in many places around the world;
- The desire of many cities to play a leadership role in confronting the threat of climate change by setting their own targets for reducing GHG emissions, which are often more ambitious than the targets set by their national governments;
- The desire of many cities and towns to have greater energy security, in terms of stable, reliable and resilient access to energy for all their citizens at a predictable cost from sources which do not pose a health risk to their populations.

Renewable energy offers cities the means of achieving all three of these goals at the same time.

Cities are now adopting strategies to increase dramatically their use of renewable energy and a small but growing number are setting targets to reach 100% renewable energy in one or more sectors of energy use. We call such cities *renewable cities*.

A goal which seemed far-fetched even a few years ago now seems within our grasp. This was the overarching and compelling insight that energized everyone at the Global Learning Forum.

# PUTTING THE PIECES TOGETHER

- The three main sectors of energy use by cities are electricity, heating and cooling of buildings, and transportation. A holistic approach to building renewable cities involves increasing energy efficiency and planning the transition to 100% renewable energy in all three of these sectors.
- Achieving this goal requires: local political leadership and citizen support; enabling policies; innovative financing; and continuously improving energy efficient technologies.
- A virtuous circle can emerge between all of these factors. Political leadership can lead to policy changes. A flow of investment capital can provide a rapid increase in renewable energy deployment. Growing demand can spur more technological innovation. Subsequent price drops for consumers can lead to further political and societal acceptance and action.
- The impetus for positive change can come from many directions: from elected officials, from private sector or social entrepreneurs, or from grassroots community initiatives. Resistance can

also arise unexpectedly especially if leaders fail to carry their communities with them. The Forum heard inspiring stories and cautionary tales from many different speakers, but the opportunities are everywhere to begin building renewable cities, if we have the vision to seize them.

## POSITIVE FINDINGS

- The benefits of renewable energy and energy efficiency apply to developed and developing economies and to local governments of all sizes and scales. The 100% RE movement provides a vision of an optimistic future: one based on practical solutions, rooted in community experience, using proven technology and inspired by non-partisan collaboration.
- Climate change is too often associated with dire predictions and untenable scenarios. Renewable energy inverts the discussion to one of opportunity. There is broad, positive political appeal of renewable energy, versus the often negative political energy around reducing fossil fuel-driven emissions.
- Renewable energy, including energy efficiency, is not tied to an ideology as it can be embraced by conservative and liberal communities alike, for similar and very different reasons. Conservative values of self-reliance and independence, conserving heritage and traditional land uses, and strengthening local community ties are all reflected in many smaller cities' and towns' renewable energy plans. Similarly, liberal values can be found in renewable energy's promise of democratization of resources, reducing energy poverty, driving technological and social innovation, and mitigating greenhouse gas emissions. The potential for consumers to lower and stabilize their energy costs by investment in energy efficiency and renewables appeals across the board.
- It is technically feasible to provide 100% of advanced economies' energy needs from renewable sources and to balance the load from wind, water, and solar resources by 2050. Additionally, the land area requirements to satisfy the energy demand are minimal compared to the benefits.
- When communicating to the public the benefits of renewable energy, climate change mitigation does not have to be the primary message. There are many other more immediate benefits to municipalities from investing in renewable energy. These include: greater control over their sources of energy, protection against cost volatility, system resilience in the face of extreme weather, better health outcomes, and more local jobs and investment.
- Designing robust renewable energy policies that can weather political change, and provide sufficient certainty for private sector investors is a challenging task. It requires thinking holistically about the benefits of renewable energy to all sectors of society, and building political will through alliances across parties and among civil society groups.

- Stakeholder and citizen engagement on renewables is crucial and must clearly communicate co-benefits for health, jobs, the urban environment and local decision-making. When citizens can see the personal economic benefits of switching to renewable energy, the transition can happen rapidly.
- The public responds positively to aesthetically pleasing and interactive technologies such as renewable energy-producing public art installations or demonstration projects. The importance of human-centred, appealing design for renewable energy systems and technology cannot be overstated.
- Smaller towns and rural municipalities can often be the first in their region to make the shift to 100% renewable energy. This happens when rural landowners in the municipality can see the economic benefits of becoming renewable energy producers for their community. Rural communities that become net energy producers through renewables can enable larger nearby cities to plan their own shift to renewable energy.
- Energy efficiency is the first fuel for any transition towards renewable energy implementation in all three sectors of urban energy use. In North America, up to a 40% improvement in energy efficiency is estimated to be needed to complete the transition.
- Strict green building codes for new builds can promote much greater efficiency for heating and cooling, making it possible to use lower temperature district energy systems. Retrofitting buildings to take advantage of geothermal heating and cooling systems can provide options for residential stock or even allow for the development of geothermal-powered district heating networks such as those popular in Europe. Technological advances such as solar-geothermal storage offer opportunities for year-round temperature regulation in modern housing developments, even in very cold climates.
- The transition to renewable energy requires long-term planning and investment in new infrastructure. This includes: continuous expansion of cost-efficient and sustainably developed renewable energy sources; reduced energy consumption and dramatic gains in end-use efficiency; and future electrical grids which are flexible, powerful, and can integrate electricity from renewable sources.
- A rapid transition to renewable energy has often been made possible by stable, supportive national and sub-national policies. Feed-in tariffs have been very successful in jurisdictions such as Germany and Ontario. These policy frameworks have allowed for citizens, farmers, small businesses and cooperatives to enter the energy market through distributed technologies. Nevertheless, even in the absence of supportive policies at the national or sub-national level, local governments can make their own decisions to switch to 100% renewable energy.
- Municipalities that control their own utilities can combine renewable energy and energy efficiency targets with social equity objectives and integrate both into their business models.







- Municipalities that do not control their own utilities can still promote the transition to renewable energy by demonstrating leadership in their own energy use, through their procurement practices and through creative incentive programs, such as verifying voluntary initiatives or creating municipal revolving funds.
- Even in jurisdictions that are not supportive of municipal energy initiatives, opportunities can exist for citizens to become consumer-owners through the creation of local energy cooperatives. Small renewable projects can be developed with strong community support and a multitude of benefits for low-income residents.
- Against the backdrop of historically low interest rates, the renewable energy industry is attractive to capital providers because it is clean, long-term, and predictable over project life spans. Cities do not necessarily need to provide the capital required for renewable energy, energy efficiency and climate resilience projects; what they need to establish are the policy frameworks to attract private sector investment.
- Financial markets, specifically through green bond issuance, could provide the necessary capital for such projects. There is a demonstrated market for green bonds, whether they are issued by private sector actors or municipalities, which is projected to be worth \$100 billion in 2015. It is less inherently risky for municipalities to access international finance markets through relatively low-risk products like bonds, than it is to not build infrastructure necessary for livable and climate resilient cities. The long-term benefits of renewables compared to full costs of non-renewables are important to consider when assessing the risks of investments in infrastructure.
- By shifting to renewable energy, cities not only mitigate climate change, but also become more adapted to its impacts. Given the increasing severity and frequency of storms along both temperate and tropical coastlines, distributed renewable energy capability offers communities flexibility and resilience to extreme weather events.

## REMAINING CHALLENGES

- While municipal governments have some of the authorities and policy levers to transition their communities towards 100% renewable energy, they certainly do not have all the powers required to mandate the job. Thus urban leaders have to exercise persuasion to encourage subnational and national governments to enact supportive policies, and they have to build an enduring foundation of support with the public and the private sector to realize this goal.
- Many utilities are unsettled by the renewable energy revolution now underway. They are unsure how to deal with citizen producer-consumers who want to sell their surplus energy to the grid and

they fear the loss of revenues from their traditional business model will undermine their ability to maintain the existing grid. Many are locked into long-term relationships with fossil fuel producers. But support from utilities is crucial for municipalities to begin the transition to 100% renewable electricity.

- The renewable energy revolution can also compound social equity issues between richer citizens who can afford to install solar PV panels on their homes and poorer citizens and renters, who lack the means or the incentives to do so. These kinds of trade-offs cannot be solved just through rate setting by the local utility. There has to be some larger community vision about what's fair and who should pay for the costs of integrating new sources of renewable energy into the grid.
- There are risks for cities in taking on the utility sector, particularly in jurisdictions with a utility monopoly backed by powerful private sector interests. Legal disputes between local governments and utilities are taking place in some US states. There are not yet effective and transferable strategies as to how cities should deal with utilities resistant to supporting the energy transition.
- It is a challenge to come up with ways of retrofitting old building stock to meet new green energy and heating efficiency standards. The upfront capital costs and long payback periods for energy retrofitting can discourage homeowners and commercial property owners from investing in efficiency. While there are financial tools and policy levers that can incent change, further strategies are needed to dramatically reduce energy usage in older building stock.
- Many cities greatly underuse their abundant geothermal resources for heating, despite the availability of simple heat pump systems as well as innovative technologies that can provide diverse housing and building types with all-season temperature control. Further use of renewable energy as the heat source in district energy systems and combined heat and power systems also requires increased deployment and support from local governments.
- The transition to 100% renewable energy in the transportation sector will require a major overhaul in the way people and goods move around cities. This will be very challenging. It includes: electrification of all public transportation; community-wide adoption of personal electric vehicles (EVs); commercial fleets powered by renewable fuels such as electricity, hydrogen or bioethanol; and a significant shift to active forms of personal transportation (walking or biking) to reduce vehicle-kilometres travelled.
- While EVs are now being produced by most major car manufacturers and they have won a devoted following among existing owners, EVs have not yet reached a critical mass in the marketplace. Most North American consumers are unaware of the benefits of driving them. Demand-side measures to increase consumer awareness of EVs may not be enough to trigger widespread uptake, and it may require supply-side regulations like California's Zero Emissions Vehicle mandate to do so.



- In most countries fossil fuels are still heavily subsidized, directly or indirectly, and the energy market highly regulated. Despite the rapid uptake of renewables in many areas of the world, a level playing field that would spark dramatic growth worldwide in renewables generation does not yet exist.

## AREAS FOR FURTHER RESEARCH AND DIALOGUE

- How can recent innovations in battery storage create new opportunities for renewable energy transitions, especially in home-produced electricity and in EV integration?
- How will the sharing economy, social networks, and disruptive technologies affect citizen participation in the urban energy economy?
- How can urban consumers influence their local energy utility to shift to renewables, especially when the utility has ready access to existing fossil fuel sources?
- How can the political will to achieve 100% renewable energy be enhanced by informal political and business alliances between large cities and their surrounding regions? Could such models of co-operation apply as well to potential new energy producers (e.g. First Nations communities) in rural or more remote areas who could supply a city with renewable electricity?
- What strategies can promote the transition to renewable energy in poor communities in either the developed or developing world where most citizens do not yet have secure access to reliable, affordable energy?
- How can we be sure that renewable energy fits within the long-term framework of sustainability? How do we take into account the ecological impact of new technologies, and assess the full life cycle of these products?
- Are there a significant policy gaps or inconsistencies between cities adopting ambitious GHG reduction strategies with carbon neutrality as the ultimate goal, and cities adopting 100% renewable energy targets?
- How can international city networks and members of the Global 100% RE campaign best support cities in transitioning to 100% renewable energy in all sectors?
- How can city-level initiatives be scaled up to achieve more ambitious climate change mitigation and adaptation at the sub-national, national and international levels?

# MULTIMEDIA AND OTHER RESOURCES

Our goal is to publish online as many resources from the Global Learning Forum as possible. See the event's webpage at [forum.renewablecities.ca](http://forum.renewablecities.ca) for a master list of speakers and sessions as well as speaker presentations. The page also contains the Global Learning Forum Program Schedule and Final Report, our media report, and multimedia from the Forum. These materials are accessible by clicking the links below.

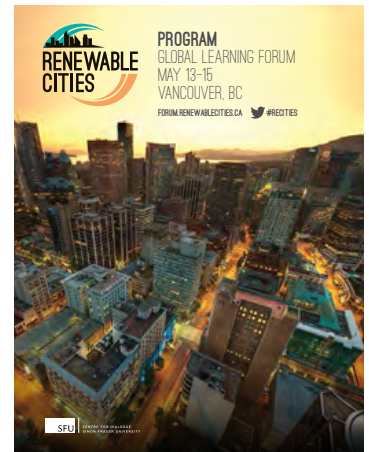
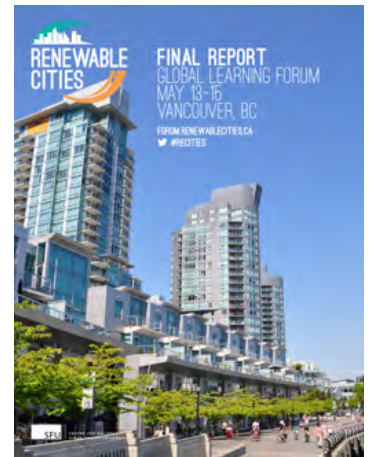


*Global program:*

[www.renewablecities.ca](http://www.renewablecities.ca)

*Global Learning Forum website:*

[forum.renewablecities.ca](http://forum.renewablecities.ca)







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